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REMARKS

Claims 1-26 are pending in the present application. Claims 1-26 have been amended herein. Further, new claims 27-31 have been added herein.

35 U.S.C. §103

Claims 1, 3, 6, 14 and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable in view of U.S. Patent No. 6,073,070 issued June 06, 2000 to Diekhans, hereinafter "Diekhans".

According to the MPEP §706.02(j) and §2143.03, in order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. "All words in a claim must be considered in judging the patentability of that claim against the prior art" *In re Wilson, 424 F.2d 1382, 1385 (CCPA 1970).*

The applicant asserts that a *prima facie* case of obviousness has not been established for claim 1 as amended herein because Diekhans fails to teach or suggest a position-determining apparatus that comprises both:

(1) at least one detector equipment placed generally at a designated place on the working machine spaced from the working part and adapted to enable the determination of the position of the designated place in a fixed coordinate system; and

(2) an inclination- and orientation-measuring device adapted to enable the determination of the orientation of the designated place on the working machine where both the position and the orientation are determined in a fixed coordinate system.

Diekhans further fails to teach or suggest a calculating device adapted receive measurements from the position-determining apparatus in the fixed coordinate system and measurements from at least one position relationship device in a machine-based coordinate system to provide at least one of the position of the working part of the tool in

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the fixed coordinate system and the orientation of the working part of the tool in the fixed coordinate system.

In support of the above rejection, the Examiner references Fig. 7 without pointing to any passage in the specification of Diekhans in support thereof, to apparently assert that Diekhans teaches at least one detector equipment at a designated place on the working machine. Fig. 7 actually shows two GPS antennas on a treatment device (an attached cutting bar). The GPS antennas are not, however, at a designated place on the working machine spaced from the working part as claimed. Further, Fig. 7 does not teach or suggest at least one position relationship device to determine the positional relationship of the working part relative to the designated place in a machine-based coordinate system. In fact, there is no need for a position relationship device as claimed because the GPS antennas are positioned directly on the working part at the points of interest (b1 and b2 as shown).

Fig. 7 is actually similar to that illustrated and described with reference to Fig. 2, except that instead of the GPS antennas getting information from satellites, the GPS data comes from a plurality of GPS towers. For all relevant purposes, however, the embodiments of Fig. 2 and Fig. 7 of Diekhans are identical. In each embodiment, a global positioning system (GPS) antenna is positioned at two spaced apart points on a treatment device. This system further includes distance sensors AS1, AS2 to determine a distance from the treatment device to the ground. A computer reads the GPS position data from the GPS antennas and uses the distance measurements from the treatment device to the ground to compute the average inclination of the treatment device from the difference of the height measuring devices relative to the ground. This data is used in conjunction with a high data cadastre to control the position of the treatment device relative to the ground.

As pointed out on page 2 of the present specification, placing the sensors on the treatment device (or moving part of the vehicle) exposes the sensors (such as GPS antennas as described by Diekhans) to risk of damage from working conditions, vibration, dirt, and mechanical damage. Further, The detectors are sometimes obscured by the vehicle or machine. At any rate, such an arrangement clearly fails to teach or suggest the use of detector equipment to detect the position of a working machine in a fixed coordinate system, and a position relationship device to determine the relative position of the working device relative to the working machine in a machine-based coordinate system.

The Examiner further argues that Diekhans teaches a calculating device that calculates the position of the working part in the fixed coordinate system citing Col. 1, lines 60-66. The applicant respectfully traverses such an argument. The passage cited by the Examiner is a discussion of a prior art German patent DE 4431824 that was not cited as a reference in this Action. The Examiner provided no basis to suggest the teaching of this non-cited German reference can be combined with Diekhans. Further, from the description of the German reference in Diekhans, it appears that the reference is not relevant to the claimed invention. In the German patent document cited in Diekhans, operational data from a combine harvester is combined with space coordinate data to provide nominal operating values for the harvester. However, data is derived from a historic cadastre to limit values of new treatments. Claim 1 does not recite obtaining historic data from a cadastre at all.

The Examiner also asserts that Diekhans teaches an inclination and orientation measuring device that measures orientation of a designated place on the working machine in a fixed coordinate system citing column 3, lines 17-20 and column 6, lines 13-15 and 53-56. Again the applicant respectfully traverses this characterization of Diekhans. Column 3 lines 17-20 describe one embodiment of Diekhans whereby the absolute position of a treatment device as the harvester harvests a strip of crops is recorded in a

memory against a terrain map so that when the harvester revisits that same strip, the terrain map can be used, for example to control the treatment device. This has absolutely nothing to do with obtaining an orientation measurement in a fixed coordinate system.

Column 6, lines 13-15 and 53-56 actually teach away from the claimed invention. In this passage, Diekhans describes placing two GPS antennas directly on the treatment device (and not the harvester). The system uses the two GPS antenna readings in conjunction with two distance measurements (a measurement from each GPS antenna to the ground) to compute an average traverse inclination angle. As such, inclination is computed from geometric conditions and is not measured. Further, the inclination is derived from the perspective of sensors on the treatment device relative to the ground, and not from the vehicle as claimed. Diekhans does not measure the orientation of the working machine in the fixed coordinate system at all.

For the above reasons, the applicant requests that the Examiner withdraw the rejection of claim 1 and the claims that depend therefrom, including claims 3 and 6 under 35 U.S.C. §103.

The applicant asserts that a *prima facie* case of obviousness has not been established for claim 14 as amended herein because Diekhans fails to teach or suggest a method for determining the position of a working part of a tool on a working machine comprising measuring both a position and an orientation of a designated place on a working machine spaced from a working part and in a fixed coordinate system.

Diekhans further fails to teach or suggest calculating in the fixed coordinate system, at least one of an instantaneous position of the working part and an instantaneous orientation of the working part based upon the measured position and orientation of the designated place of the working machine and the positional relationship of the working

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part relative to the designated place. Arguments in support of the above are set out more fully with reference to the traversal of the rejection to claim 1.

For the above reasons, the applicant requests that the Examiner withdraw the rejection of claim 14 and the claims that depend therefrom, including claim 19 under 35 U.S.C. §103.

Claims 4, 7 and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Diekhans in view of U.S. Patent No. 6,211,821 issued April 03, 2001 to Ford, hereinafter "Ford". Ford does not teach or suggest all of the limitations of claims 1 and 14 from which the above-rejected claims depend, including for example, those limitations discussed above with respect to Diekhans. Further, the applicant does not understand this rejection. Claims 4 and 7 do not recite a north-seeking target unit. That said, with respect to claim 4, neither Diekhans nor Ford teaches or suggests a position detector rotatable around an axis placed a distance therefrom, wherein measurement towards the position detector unit is indicated when the detector unit reaches determined angular positions around the axis in relation to the working machine as claimed.

Ford teaches a navigational apparatus that uses satellite signals to compute corrected positions. The section of Ford cited by the Examiner is again the background section wherein it is stated that redundant north seeking gyroscopes have been used to determine the azimuth of a ship or aircraft. The recitation cited by the Examiner does not however, provide any motivation to combine north seeking gyroscopes with the other limitations of the claimed invention.

With respect to claim 7, neither Diekhans nor Ford teaches or suggests a geodesic instrument with target-seeking function placed at a distance from the working machine and measuring against at least one target on the working machine as claimed. Further, with

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respect to claim 15, Diekhans combined with Ford fails to teach or suggest fixedly placing at least one detector unit and a north-seeking unit on the working machine for instantaneous sensing of the direction of the working machine in relation to north. Accordingly, the applicant requests the Examiner to withdraw the rejection to claims 4, 7 and 15 under 35 U.S.C. §103(a).

Claims 5, 8, 18 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Diekhans in view of U.S. Patent No. 5,606,444 issued February 25, 1997 to Johnson et al. hereinafter "Johnson". Johnson does not teach or suggest all of the limitations of claims 1 and 14 from which the above-rejected claims depend, including for example, those limitations discussed above with respect to Diekhans. Further, Johnson even when combined with Diekhans still fails to teach or suggest all of the limitations of the above-rejected claims. The Examiner again relies on the background of a reference instead of a teaching in the reference itself. Such generalized statements provide neither the motivation to combine nor do they establish the likelihood of success as required by the M.P.E.P. §706.02(a). Additionally, even if the Examiner could use this teaching, which the applicant asserts is wholly improper, the references still fail to teach or suggest all of the claimed limitations.

Johnson teaches automatic alignment of optical data transceivers with respect to a likely moving computer in an aircraft and a stationary computer at a ground location. Johnson states in the background that "...free space optical communications systems often have a narrow field of view and, as such, require additional control systems to align the optical transceivers to ensure proper data transmission" (Col. 2, lines 9-12). The system in Johnson is "passive" such that no special equipment is needed to align the optical transceivers (Column 7, lines 36-41).

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Referring to claim 5, such teaching fails to teach or suggest at least one rotatably mounted and controllable optical unit placed on a working machine and adapted to align itself towards a stationary measuring station.

With respect to claim 8, neither Johnson nor Diekhans teaches or suggests that each target is provided with an alignment indicator that gives alignment indications to a geodesic instrument.

With respect to claim 18, Diekhans combined with Johnson fails to teach or suggest rotatably mounting at least one controllable optical unit on the working machine, indicating the orientation of the optical unit in relation to the working machine and calculating the orientation of the working machine in the fixed coordinate system. Accordingly, the applicant requests that the Examiner withdraw the rejection to claims 5, 8, 18 and 20 under 35 U.S.C. §103(a).

Claims 9 and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Diekhans in view of U.S. Patent No. 6,374,190 issued April 16, 2002 to Schupfner hereinafter "Schupfner". Schupfner does not teach or suggest all of the limitations of claims 1 and 14 from which the above-rejected claims depend, including for example, those limitations discussed above with respect to Diekhans.

The Examiner cites Column 1, lines 17-25 in support of the rejection to claims 9 and 22. The applicant respectfully traverses this rejection. The passage in Schupfner cited by the Examiner deals with variations in inexpensive gyroscopes used in navigation systems due to temperature dependence. Further, Schupfner teaches a method of calibrating an angle sensor influenced by operating temperature. Schupfner has nothing whatsoever to do with that which is claimed in claims 9 and 22, that is providing a map with stored topology of an area to be treated and presenting data for the working part

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relative to the map on a presentation unit. Accordingly, the applicant requests the Examiner withdraw the rejection to claims 9 and 22 under 35 U.S.C. §103(a).

Claim 21 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Diekhans in view of Johnson, and further in view of Ford. The Examiner argues that Ford teaches a north-seeking target unit thus rendering claim 21 obvious. The applicant does not understand this rejection. Claim 21 does not recite a north seeking target. Further, as pointed out above, Diekhans combined with Ford and Johnson still fail to teach or suggest all of the limitations to claim 14 from which claim 21 depends. Accordingly, the applicant requests that the Examiner withdraw the rejection to claim 21 under 35 U.S.C. §103(a).

Claims 10 and 23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Diekhans in view of U.S. Patent No. 5,798,733 issued August 25, 1998 to Ethridge, hereinafter "Ethridge". Ethridge does not teach or suggest all of the limitations of claims 1 and 14 from which the above-rejected claims depend, including for example, those limitations discussed above with respect to Diekhans.

The Examiner cites Column 2, lines 17-23 in support of this rejection. This passage of Ethridge has nothing at all do with the claimed invention. Specifically, Ethridge combined with Diekhans fails to teach or suggest both a relatively slow determining device and a relatively fast determining device that reacts on at least one of position and orientation differences. Ethridge teaches a location guidance system for parachute jumpers. Basically, future positions of parachute jumpers is predicted based upon current position information and some pre-stored information that contains data with respect to the target position and profile of the projected jumper landing site. At periodic update intervals, the predicted destination position is updated (Column 5, lines 10-25). Accordingly, the applicant requests that the Examiner withdraw the rejection to claims 10 and 23 under 35 U.S.C. §103(a).

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Claims 11 and 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Diekhans in view of Ethridge and further in view of U.S. Patent No. 5,774,832 issued August 25, 1998 to Vanderwerf, hereinafter "Vanderwerf". Vanderwerf does not teach or suggest all of the limitations of claims 1 and 14 from which the above-rejected claims depend, including for example, those limitations discussed above with respect to Diekhans. Accordingly, the applicant requests that the Examiner withdraw the rejection to claims 11 and 24 under 35 U.S.C. §103(a).

Claims 12 and 25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Diekhans in view of Ethridge and further in view of U.S. Patent No. 5,974,675 issued November 02, 1999 to Yamada et al., hereinafter "Yamada". Yamada does not teach or suggest all of the limitations of claims 1 and 14 from which the above-rejected claims depend, including for example, those limitations discussed above with respect to Diekhans. Accordingly, the applicant requests that the Examiner withdraw the rejection to claims 12 and 25 under 35 U.S.C. §103(a).

35 U.S.C. §112

Claims 2 and 15 were rejected under 35 U.S.C. §112, second paragraph asserting that the phrase "such as" in each claim renders that claim indefinite. The applicant has amended the above claims to remove the "such as" phrase. As such, the applicant requests the Examiner withdraw the rejection to claims 2 and 15.

Claims 7 and 20 were rejected under 35 U.S.C. §112, second paragraph asserting that the phrase "e.g." in each claim renders that claim indefinite. The applicant has amended the above claims to remove the "e.g." phrase. As such, the applicant requests the Examiner withdraw the rejection to claims 7 and 20.

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Claims 4 and 17 were rejected under 35 U.S.C. §112, second paragraph asserting that the phrase "it" in each claim does not define the metes and bounds of the invention. The applicant has amended the above claims to remove the "it" reference. As such, the applicant requests the Examiner withdraw the rejection to claims 4 and 17.

Claims 13 and 26 were rejected under 35 U.S.C. §112, second paragraph asserting that the claims are unclear. The applicant has amended the above claims to provide clarity to that which is being claimed. As such, the applicant requests the Examiner withdraw the rejection to claims 13 and 26.

NEW CLAIMS

New claims 27-31 have been added herein. These claims however, are dependent upon base claims that the applicant believes to be in condition for allowance.

CONCLUSION

For all of the above reasons, the applicant respectfully submits that claims 1-26 and newly added claims 27-31 represent allowable subject matter. The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to

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discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

Please replace the paragraph starting on page 1, line 3 with the following:

The present invention relates generally to ~~a~~ devices for determining the position of a working part of a tool on a working machine with a position-determining apparatus ~~of the type stated in the introduction to claim 1~~, and ~~a~~ methods ~~of the type which is stated in the introduction to claim 14~~ for determining the position of a working part of a tool on a working machine. ~~:~~ – The invention concerns particularly the controlling of an industrial machine, for example a ground-~~levelling~~ leveling machine, crane, dredger or the like.

Please replace the paragraph starting on page 1, line 9 with the following:

During road construction or the ~~levelling~~ leveling of ground, for example for buildings, parks or playgrounds, vehicle displays or the like, ground preparation machines are used which are to give a predetermined topography to the piece of ground through, on one hand digging and on the other hand piling up material.

Please replace the paragraph starting on page 1, line 14 with the following:

It is important in this connection that the working tools on the machines ~~which~~that are used can be accurately controlled to the exact right working level in the intended section. The control should preferably even be able to be remote-controlled automatically so that the desired topography in the right position inside a section should be able to be written into a computer ~~programme~~ program and information concerning suitable processing should be able to be given continuously and automatically to the driver of the vehicle. It should also, in the cases where it is possible, be able to have automatic controlling of the machines in order to perform certain work completely automatically.

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Please replace the paragraph starting at page 3, line 26 with the following:

Objects of the invention

One object of the invention is to provide ~~a control resp. a~~ a control indication for a ground-preparing machine, which makes possible adequate control of the machine with so few as possible measuring units placed outside the machine.

Please replace the paragraph starting on page 17, line 13 with the following:

The desired ground preparation in the fixed coordinate system is programmed into either the computer 20 of the geodesic instrument 1 or preferably of the machine 3. This is equipped with a presentation unit 9, preferably a screen, which presents to the operator of the machine (not shown), on one hand, how the machine 3 and its scraper blade 8 are to be ~~manoeuvred~~maneuvered based on its instantaneous existing position and, on the other hand, its instantaneous deviation from the desired ~~manoeuvring~~maneuvering. Alternatively and preferably an automatic guidance of the working part to the intended height and orientation is performed with the help of the control equipment 12 consisting of, for example, hydraulic ~~manoeuvring~~maneuvering means which are controlled by the unit 20.

Please replace the paragraph starting on page 19, line 16 with the following:

These measurement sequences are repeated during the machine's scraper work, whereby the machine operator the whole time during the working progress obtains instantaneous data concerning the scraper blade's position, alignment, direction of displacement and speed in the fixed coordinate system, and consequently obtains an extremely good idea of how the work is progressing compared to the desired ground preparation, and how the machine is to be ~~manoeuvred~~maneuvered.

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IN THE CLAIMS

1. (Amended) A ~~Device~~system for determining the position ~~for~~ of a working part of a tool on a working machine comprising: ~~with~~

a position-determining apparatus ~~(1,4,5a,5b,6;1,4a,4b,5a,5b,6; 31,33; 49,50,51,1',53)~~ comprising:

at least one detector equipment ~~(4,5a,5b,6; 4a,4b,5a,5b,6; 31,40,50,51,53)~~ placed generally at a designated place on the working machine spaced from the working part and adapted to enable the determination of the position of the designated place in a fixed coordinate system ~~(3;52) in order to determine the position of this place in a fixed coordinate system, and with~~; and

an inclination- and orientation-measuring device adapted to enable the determination of the orientation of the designated place on the working machine in the fixed coordinate system,

at least one position relationship device ~~(11) in order to~~ adapted to enable the determination of ~~determine the~~ a positional relationship of the working part of the tool relative to the designated place on the working machine~~detector equipment~~ in a machine-based coordinate system; ~~, and~~

a calculating device ~~(20)with which~~ adapted receive measurements from the position-determining apparatus in the fixed coordinate system and measurements from the at least one position relationship device in the machine-based coordinate system to provide at least one of the position of the working part of the tool in the fixed coordinate system and the orientation of the working part of the tool in the fixed coordinate system. ~~signals from the position-determining apparatus and the positional relationship device calculates the position of the working part in the fixed coordinate system, characterized in that the position-determining apparatus comprises an inclination- and orientation-measuring device (5a,5b,20;4a,4b,20;3-1,20;51,20) so that the apparatus~~

~~instantaneously measures both the position as well as the orientation of said place on the working machine in the fixed coordinate system, and that the calculating device (20) converts the measuring result from the position determining apparatus and the positional relationship device in order to give the instantaneous position and/or orientation of the working part in the fixed coordinate system.~~

2. (Amended) The system~~Device~~ according to ~~Claim~~ claim 1, wherein:~~characterized in that~~

the ~~position determining apparatus~~at least one detector equipment comprises at least one detector unit ~~(4),~~ fixedly placed on the working machine;~~,~~ and

the inclination- and orientation-measuring device comprises a north-seeking unit ~~(5b), such as a north seeking gyroscope or an electronically readable compass,~~ adapted to ~~for~~ instantaneously sense~~ing of~~ the direction of the working machine in relation to north.

3. (Amended) The system~~Device~~ according to claim 1 wherein:~~where~~

the position-determining apparatus further comprises a stationary measuring station ~~(1;1')~~ placed in the vicinity of the working machine, the stationary measuring station operatively configured to determine ~~for determining~~ the position of the working machine in cooperation with the detector ~~device~~equipment; and~~, in accordance with Claim 1,~~

~~characterized in that~~ the at least one detector equipment~~the position- and orientation-determining apparatus~~ comprises ~~either~~ at least two detector units ~~(4a,4b)~~ placed at the designated place on the working machine arranged in fixed positions relative to the working machine, said at least two detectors arranged to cooperate with the stationary measuring station to ~~which in cooperation with the stationary station give positions fixed in space for their placements and the mutually measured positions of which~~ give the orientation in space for the designated place on the working machine~~ part of the working machine where they are placed, or at least one movable detector unit (33;50) movable between positions with determinable positions in relation to the working machine.~~

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4. (Amended) The system~~Device~~ according to ~~Claim~~ claim 3~~2~~8, characterized in that the ~~position~~ detector unit ~~(33;50)~~ is rotatable around an axis ~~(32)~~ placed at a distance therefrom ~~in relation to the working machine~~, ~~whereby~~ said device further configured such that measurement towards the ~~position~~ detector unit is indicated when ~~it~~the detector unit reaches determined angular positions around the axis in relation to the working machine.

5. (Amended) The system~~Device~~ according to ~~Claim~~ claim 1, characterized by at least one rotatably mounted and controllable optical unit ~~(26-28,23)~~ placed on the working machine~~, which optical unit aligns~~ and adapted to align ~~itself~~ towards ~~the~~ a stationary measuring station ~~with the help of either the measuring beam of the stationary station or a beam parallel with this beam or a beam transmitted from the optical unit and reflected in a prism in the stationary station,~~ ~~whereby~~ such that the orientation of the optical unit relative to the working machine is indicated and transmitted to the calculating ~~unit~~device ~~(20)~~ for determination of the orientation of the working machine in the fixed coordinate system.

6.(Twice Amended) The system~~Device~~ according to claim 1, characterized in that each of the ~~position detector unit is~~at least one detector equipment comprises at least one radio navigation antenna ~~(50,53)~~ with a corresponding receiver.

7. (Twice Amended) The system~~Device~~ according to claim 1, characterized in that the position~~-~~ determining apparatus comprises a geodesic instrument ~~(1;1')~~ with target-seeking function~~,~~ placed at a distance from the working machine ~~(3)~~ and measuring against at least one target~~, e.g. a reflector,~~ on the working machine.

8. (Amended) The system~~Device~~ according to ~~Claim~~ claim 7, characterized in that each respective target ~~(4a,4b)~~ is provided with an alignment indicator ~~(12,13), which gives~~

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adapted to provide alignment indications for the geodesic instrument concerning the respective target towards which ~~its~~ instantaneous target-seeking is to be made and for measuring towards ~~this~~ the respective target.

9. (Twice Amended) The system~~Device~~ according to ~~Claim~~ claim 1, characterized in that the calculating device ~~(20) is provided with~~comprises:

_____a stored map with ~~the~~ a desired topography of an area which is to be treated~~,~~; ~~and~~

_____~~calculated~~ data for the working part ~~for~~ configured to provide position and angular positions relative to the map; and

_____~~are presented on~~ a presentation unit configured to present the map and calculated data. ~~(9) (Fig. 8).~~

10. (Twice Amended) The system~~Device~~ according to ~~Claim~~ claim 1, characterized in that the position~~ and orientation~~ determining apparatus comprises ~~partly~~ a relatively slow, accurate determining device ~~(1,4;1,4a,4b;53,50,51),~~ which at time intervals accurately measures the actual position and orientation of the working machine, and ~~partly~~ a relatively ~~slow~~ fast determining device ~~(ACC;ACC-1,ACC2;6),~~ which reacts on at least one of position and~~/or~~ orientation differences to at least one earlier determination ~~or determinations~~ in order to calculate and update the determination between the said time intervals.

11. (Amended) The system~~Device~~ according to ~~Claim~~ claim 10, characterized in that the relatively fast determining device comprises at least one accelerometer device ~~(6;ACC 1; ACC 1,ACC2)~~ on the working machine ~~for measuring~~adapted to measure the acceleration of the machine in at least one direction~~, preferably in several mutually different directions,~~ ~~whereby~~ and the calculating unit ~~(20) integrates~~ is further configured to integrate the indicated acceleration(s) and updates the latest calculation result of the position of the working part in the fixed coordinate system.

12. (Amended) The system~~Device~~ according to ~~Claim~~ claim 10, characterized in that the relatively fast determining device comprises at least one rotation-indicating device ~~(6)~~ for rotation around at least one axis of the machine.

13. (Twice Amended) The system~~Device~~ according to claim 1, characterized in that the calculating unit ~~(20)~~ uses earlier calculation results to calculate ~~the~~ a probable position, orientation, direction of work and speed a certain time in advance for the working part of the working machine.

14. (Amended) A ~~M~~method for determining the position ~~of~~ a working part of a tool on a working machine comprising: ~~, whereby the position of the working machine is determined in at least one defined place on the working machine in a fixed coordinate system, at the same time as the positional relationship relative to the defined position is determined in a machine-based coordinate system, and the position of the working part is calculated in the fixed coordinate system, characterized by~~ comprising:

- measuring ~~instantaneously~~ both ~~the~~ a position and ~~the~~ an orientation of ~~said position~~ a designated place on the working machine spaced from the working part and in ~~the~~ a fixed coordinate system~~,~~;

determining a positional relationship of the working part relative to the designated place in a machine-based coordinate system; and

calculating in the fixed coordinate system, at least one of ~~the~~ an instantaneous position of the working part and/~~or~~ an instantaneous orientation of the working part ~~in the fixed coordinate system with the help of the result of the instantaneous measurement.~~ based upon the measured position and orientation of the designated place of the working machine and the positional relationship of the working part relative to the designated place.

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15. (Amended) The ~~M~~method according to ~~Claim~~ claim 14, further comprising ~~characterized by~~ fixedly placing~~ement on the working machine of~~ at least one detector unit ~~(4)~~ and a north-seeking unit on the working machine ~~(5b), such as a north-seeking gyroscope or an electronically readable compass~~ for instantaneous sensing of the direction of the working machine in relation to north.

16. (Amended) The ~~M~~method according to claim 14, wherein: ~~where~~

~~_____~~ the act of measuring ~~instantaneously~~ the position of the designated place on the working machine comprises:

utilizing ~~the position determination takes place with the help of~~ a stationary measuring station ~~(1; 1')~~ placed in the vicinity of the working machine ~~for determining the position in cooperation~~adapted to cooperate with a ~~the~~ detector device; ~~, according to Claim 14, characterized in that~~ and

~~_____~~ ~~the position and orientation determination takes place either against~~ providing at least two detector units ~~(4a,4b)~~ placed at the designated place on the working machine arranged in fixed positions relative to the working machine, said at least two detectors arranged to cooperate with the stationary measuring station to give the orientation in space for the designated place on the working machine. ~~in fixed positions relative to the working machine which in cooperation with the stationary station gives positions fixed in space for their positions and the mutually measured positions of which give the orientation in space for the part of the working machine where they are placed or against at least one movable position detector unit (33;50), which can move between positions with defined positions in relation to the working machine.~~

17. (Amended) The m~~M~~ethod according to ~~Claim~~ claim ~~16~~31, ~~characterized by~~further comprising:

~~_____~~ ~~rotating~~rotation ~~of~~ the ~~position~~ detector unit ~~(33;50)~~ around an axis ~~(32)~~ placed at a distance ~~from it~~therefrom ~~in relation to the working machine~~; and

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measuring against the ~~position~~ detector unit when the ~~position~~ detector unit~~it~~ takes up determinable angular positions around the axis in relation to the working machine.

18. (Amended) The ~~M~~method according to ~~Claim~~ claim 14, ~~characterized by~~further comprising:

~~rotatable~~rotatably mounting ~~of~~ at least one controllable optical unit ~~(26-28,23)~~ on the working machine;

align~~ing~~ment ~~of~~ the optical unit to the stationary measuring station;

~~with the help of either the measuring beam of the stationary station or a beam parallel with this beam or a beam transmitted from the optical unit and reflected in a prism on the stationary station;~~

indicating~~indication of~~ the orientation of the optical unit in relation to the working machine; ~~;~~ and

calculating ~~calculation for determining of~~ the orientation of the working machine in the fixed coordinate system.

19. (Twice Amended) The m~~M~~ethod according to ~~Claim~~ claim 14, characterized in that the ~~instantaneous~~ measuring of both position and orientation is performed with the help of at least one radio navigation antenna ~~(50,51)~~ with a corresponding receiver.

20. (Twice Amended) The ~~M~~method according to claim 14, characterized in that the ~~instantaneous~~ measuring of both position and orientation comprises:

~~is performed with the help of~~providing a geodesic instrument ~~(1;1')~~ with target-seeking function, placed at a distance from the working machine; ~~(3)~~ and

measuring against at least one target, ~~e.g. a reflector,~~ on the working machine.

21. (Amended) The ~~M~~method according to ~~Claim~~ claim 20, ~~characterized by~~further comprising providing direction-indication for the geodesic instrument as to ~~the~~ an

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associated target towards which ~~its~~ instantaneous target seeking is to be performed for measuring against ~~this~~ the associated target.

22. (Twice Amended) The ~~M~~method according to claim 14, characterized by storing ~~of~~ a map with desired topography of a region which is to be processed in a calculating device, ~~and~~ calculating ~~of~~ data for the working part and presentation thereof as position and angular positions relative to the map, on a presentation unit ~~(9) (Fig.8)~~.

23. (Twice Amended) The ~~M~~method according to claim 14~~1~~, characterized in that the position and orientation determination is performed ~~partly with~~comprising a relatively slow determination in order to measure, at time intervals, at least one of the actual position of the working machine and ~~/or~~ the orientation of the working machine, and ~~partly with~~ a relatively fast determination ~~(ACC-1, ACC2,6),~~ which reacts to at least one of position and~~/or~~ orientation differences relative to earlier determination(s) in order to calculate and update the determination between the said time intervals.

24. (Amended) The ~~M~~method according to ~~Claim~~ claim 23, ~~characterized by, at~~wherein the relatively fast determination comprises:

acceleration-measuring in at least one direction~~,~~

~~, preferably in several mutually different directions;~~ integrating~~ion of~~ the indicated acceleration(s); and

updating ~~of~~ the latest calculation result of at least one of the position and~~/or~~ the orientation in the fixed coordinate system.

25. (Amended) The ~~M~~method according to ~~Claim~~ claim 23, characterized in that, at the relatively fast determination, at least one rotation-indication is performed for rotation around at least one axis of the machine.

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26. (Twice Amended) The ~~M~~method according to claim 14, characterized by calculation, with the help of earlier calculation results, of a probable position, orientation, working direction and speed a certain time in advance for the working part of the working machine.